UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,311	11/21/2005	Sankar Narayan Jagannathan	1890-0188	6425

7590 03/12/2009

Maginot, Moore & Beck LLP
111 Monument Circle, Suite 3250
Indianapolis, IN 46204-5109

EXAMINER	
TAHA, SHAQ	
ART UNIT	PAPER NUMBER
2446	
MAIL DATE	DELIVERY MODE
03/12/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/524,311	JAGANNATHAN ET AL.	
	Examiner	Art Unit	
	SHAQ TAHA	2446	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18, and 20 - 37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18, and 20 - 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02/07/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This is a final action for application number 10/524,311 based on after a non-final filed on 11/0682008. The original application was filed on 11/21/2005. Claims 18, and 20 - 37 are currently pending and have been considered below. Claims 18, 30, and 36 are independent claims.

Applicant's Response

Applicant's arguments filed in the amendment filed 11/08/08 have been fully considered but they are not persuasive. The reasons are set forth below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 18, and 20 - 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gemelli et al. (US 7,289,502), in view of Huang et al. (US 20030081554).

Regarding claim 18, 30, and 36, a method for routing of data .packets, comprising the steps: (a) extracting a destination address identifier from a data packet to be forwarded, **[a masked address 1 obtained by making an AND between a packets destination address 2, wherein obtaining an address is extracting from a data packet, (Gemelli et al., Col. 3, Lines 52-54, Fig. 1)],**

(b) compressing the destination address identifier using a compression algorithm, **[a method and device for routing or compressing packets destination address through an electronic routing or compressing device, said packet destination address being n bit packets comprising an address indicative of a desired destination, (Gemelli et al., Col. 1, Lines 8-11)],**

(c) comparing the compressed destination address identifier with forwarding addresses available for routing, **[When an IP address, identified in the current IP version 4 implementations by a unique 32-bit field, is received by a router, the network prefix contained in this address must be considered in order to search in a forwarding table using the network prefix as its key and in order to determine which entry in the table represents the best route for the address to take in its journey across its destination, (Gemelli et al., Col. 1 lines 53 - 57)],**

each entry corresponding to a forwarding address available for routing, **[generating an address mask until an entry matching a masked address obtained by making a masking operation between said packet destination address and said address mask, is found in said data base, (Gemelli et al., Col. 2, Lines 65-67)],**

and (d) if a positive comparison between the compressed destination address identifier and an entry stored in the routing table is found in step (c), then switching the data packet to an output link associated with the forwarding address corresponding to the entry, **[if a match is found, stopping said generation of address masks and outputting the output data link corresponding to said match, wherein the data packet will be switched to an output link associated with the forwarding address, (Gemelli et al., Col. 3, Lines 28-30)],**

Gemelli et al. fails to teaches the that forwarding addresses have been compressed using the compression algorithm and stored as entries of a routing table entries of a routing table,

Huang et al. teaches FIG. 2a and FIG. 2b show a compression bit map (CEM) method of the conventional 8-bit network address forwarding table in FIG. 1. CBM forwarding table 520 sets each of the starting entries of the range in the forwarding table 510 by bit **"1"**, and other entries by bit **"0"**, as shown in FIG. 2a, **(Huang et al., Paragraph 7, Page 1)**, to occupy only (2.sup.8 bits+7 bytes) memory space, which is smaller than the forwarding table, **(Huang et al., Paragraph 7,Page 1)**,

it would have been obvious to one of ordinary skill in the art at the time of the invention was made to Gemelli et al. by compressing the forwarding address to occupy less memory space, which is smaller than the forwarding table, **(Huang et al., Paragraph 7,Page 1).**

Regarding claim 20, 32 and 37, the method according to claim 18, wherein the compression algorithm comprises a lossless data compression algorithm, **[a method wherein a predictable duration routing or compression method is used, wherein a pipelined compression algorithm is used, (Gemelli et al., Col. 9, Lines 44-47)].**

Regarding claim 23, the method according to claim 19, wherein step (c) further comprises comparing the compressed destination address identifier with entries of the routing table taking into account a similarity between the compressed destination address identifier and a compressed destination address identifier of a preceding data packet, **[A possible high-level source code listing the software for implementing the above-described method with a CSSA algorithm will now be described. The IP address is expressed in binary notation and has bit 31 as the less significant bit and bit 0 as the most significant one, (Gemelli et al., Col. 5, Lines 8)].**

Regarding claim 24, the method according to claim 19, wherein step b) further comprises compressing the destination address identifier using a code table that associates a code word to a symbol of the destination address identifier and to a symbol of each forwarding address, respectively, **[A possible high-level source code listing the software for implementing the above-described method with a CSSA algorithm will now be described. The IP address is expressed in binary notation and has bit 31 as the less significant bit and bit 0 as the most significant one,**

(Gemelli et al., Col. 5, Lines 8)].

Regarding claim 25, the method according to claim 24, wherein each symbol of the destination address identifier and each symbol of a forwarding address, respectively, comprises a plurality of bits of the destination address identifier and a plurality of bits of the forwarding address, respectively, **[Fig. 2, Ref # 3A, wherein a destination address comprises a plurality of bits, (Gemelli et al., Col. 4, Lines 5-10)].**

Regarding claim 26, the method according to claim 25, wherein each symbol of the destination address identifier and each symbol of the forwarding addresses comprises four successive bits of the destination address identifier and the forwarding address, respectively, **[The first portion 14A of the mask comprises twenty-eight bits and the second part 15A four bits, (Gemelli et al., Col. 4, Lines 1-3)].**

Regarding claim 27, the method according to claim 24, wherein step b) further comprises compressing the destination address identifier using the code table that associates the code word to the symbol of the destination address identifier, **[a method and device for routing or compressing packets destination address through an electronic routing or compressing device, said packet destination address being n bit packets comprising an address indicative of a desired destination, (Gemelli et al., Col. 1, Lines 8-11)],**

the length of each code word being inversely related to an appearance probability of a corresponding symbol in the code table, **[The real situation may be different and the performances of the whole system depend on several factors like minimum inter-arrival time of packets, minimum packet length, parallelism used to transmit packets and clock frequency of the hardware implementing the described algorithm, (Gemelli et al., Col. 5, Lines 2-7)].**

Regarding claim 28, the method according to claim 24, wherein step b) further comprises compressing the destination address identifier using the code table that associates the code word to the symbol of the destination address identifier, **[a method and device for routing or compressing packets destination address through an electronic routing or compressing device, said packet destination address being n bit packets comprising an address indicative of a desired destination, (Gemelli et al., Col. 1, Lines 8-11)],**

the length of each code word being inversely related to an appearance probability of a corresponding symbol in the destination address identifier of an input data packet, **[The real situation may be different and the performances of the whole system depend on several factors like minimum inter-arrival time of packets, minimum packet length, parallelism used to transmit packets and clock frequency of the hardware implementing the described algorithm, (Gemelli et al., Col. 5, Lines 2-7)].**

Regarding claim 35, the routing apparatus according to claim 12, wherein the routing unit is operably connected to provide feedback information to the first data compressor, **[a processor implementing CSSA algorithm and is connected to an input line 9A, which inputs a compression or routing request, and an output line 9B, which outputs a compression or routing request result, and, if found, the best matching compressed or routing address, (Gemelli et al., Col. 7, Lines 47-51)].**

Claims 21 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gemelli et al. (US 7,289,502) in view of Huang et al. (US 2003/0081554), and further in view of Okada et al. (US 6,026,198)

Regarding Claim 21 and 33, Gemelli et al teaches a method and device for routing or compressing packets destination address through an electronic routing or compressing device, said packet destination address being n bit packets comprising an address indicative of a desired destination, **(Gemelli et al., Col. 1, Lines 8-11),**

Gemelli et al fails to teach Huffman algorithms and Lempel-Ziv,

Okada teaches handling data having a fixed-order context, a data compression system uses a pipeline control unit to enable an occurrence frequency modeling unit and entropy coding unit to operate in pipelining. A data restoration system uses a pipeline control unit to enable an entropy decoding unit and occurrence frequency modeling unit to operate in pipelining, **(Okada et a., Col. 9, Lines 60-65),** and further teaches Huffman algorithms and Lempel-Ziv algorithm , **(Okada et a., Col. 2, line 10) &**

(Okada et a., Col. 1, line 47), to have the advantage of using Huffman algorithms and Lempel-Ziv algorithm to compress data,

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Gemelli by including Huffman algorithms and Lempel-Ziv algorithm **(Okada et a., Col. 2, line 10) & (Okada et a., Col. 1, line 47),** to have the advantage of using Huffman algorithms and Lempel-Ziv algorithm to compress data.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gemelli et al. (US 7,289,502) in view of Huang et al. (US 2003/0081554), and further in view of Yamato et al. (US 6,094,431)

Regarding Claim 29, Gemelli et al teaches a method and device for routing or compressing packets destination address through an electronic routing or compressing device, said packet destination address being n bit packets comprising an address indicative of a desired destination, **(Gemelli et al., Col. 1, Lines 8-11),**

Gemelli et al fails to teach that forwarding data packet from an IPv6,

Yamato teaches that for the identifier of the IP packet flow, when the packet is in a format according to the Internet Protocol Version 6 (IPv6), a set of a flow label value and a source address value given in the header portion of the packet is used, **(Column 24, lines 45 - 52),** to forwarding data packet from an IPv6.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Gemelli et al. by including an IPv6 to forward data packet as taught by Yamato.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gemelli et al. (US 7,289,502), in view of Huang et al. (US 2003/0081554)

Regarding claim 31, Gemelli et al. teaches a method and device for routing or compressing packets destination address through an electronic routing or compressing device, said packet destination address being n bit packets comprising an address indicative of a desired destination**, (Gemelli et al., Col. 1, Lines 8-11),**

Gemelli et al. fails to teaches the that forwarding addresses have been compressed using the compression algorithm and stored as entries of a routing table entries of a routing table,

Huang et al. teaches FIG. 2a and FIG. 2b show a compression bit map (CEM) method of the conventional 8-bit network address forwarding table in FIG. 1. CBM forwarding table 520 sets each of the starting entries of the range in the forwarding table 510 by bit **"1"**, and other entries by bit **"0"**, as shown in FIG. 2a, **(Huang et al., Paragraph 7, Page 1)**, to occupy only (2.sup.8 bits+7 bytes) memory space, which is smaller than the forwarding table, **(Huang et al., Paragraph 7,Page 1)**,

it would have been obvious to one of ordinary skill in the art at the time of the invention was made to Gemelli et al. by compressing the forwarding address to occupy

less memory space, which is smaller than the forwarding table, **(Huang et al., Paragraph 7,Page 1)**

Claims 22 and 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gemelli et al. (US 7,289,502), in view of Huang et al. (US 2003/0081554), and further in view of Patej et al. (US 2003/0222996)

Regarding claims 22 and 34, Gemelli et al. teaches a method and device for routing or compressing packets destination address through an electronic routing or compressing device, said packet destination address being n bit packets comprising an address indicative of a desired destination, **(Gemelli et al., Col. 1, Lines 8-11),**

Gemelli et al. fails to teach adjusting at least one parameter of the data compression algorithm in dependence upon data characteristics of the destination address identifier,

Patej et al teaches adjusting compression parameters in response to an analysis of the captured image information, **(Patej et al., Paragraph 7, Page 1)**, to change the compression ratio (for example, quality setting), and so adjust the volume, the file size, or bitrates of the compressed data, **(Patej et al., Paragraph 20, Page 2)**,

it would have been obvious to one of ordinary skill in the art at the time of the invention was made to Gemelli et al. by adjusting compression parameters in response to an analysis of the captured image information, **(Patej et al., Paragraph 7, Page 1)**, to

change the compression ratio (for example, quality setting), and so adjust the volume, the file size, or bitrates of the compressed data, **(Patej et al., Paragraph 20, Page 2)**.

Response to Arguments

The Applicant Argues:

That Gemelli also fails to teach a comparison between a compressed destination address identifier with compressed forwarding addresses so as to find a correspondence between the destination address and an entry of the routing table.

In response, the examiner respectfully submits: Gemelli et al. teaches routing or compressing packets destination address through an electronic routing or compressing device, the packets destination address being n bit packets and having address indicative of a desired destination, wherein the routing table search process is the most important operation in the IP routing method. When an IP address, identified in the current IP version 4 implementations by a unique 32-bit field, is received by a router, the network prefix contained in this address must be considered in order to search in a forwarding table using the network prefix as its key and in order to determine which entry in the table represents the best route for the address to take in its journey across its destination, wherein the routing table search process searches for an IP address by comparing the prefix of each IP address in the table, (Gemelli et al., Col. 1 lines 53 - 57)

The Applicant Argues:

That Gemelli also fails to teach that forwarding addresses are compressed using the same compression algorithm as used for the destination addresses.

In response, the examiner respectfully submits: Gemelli et al. in view of Huang et al. teaches compressing the network prefix in order to perform the search in a table having a limited size. Many compression methods are known. In particular, we will refer to a method based on predictable duration algorithms, and among this class of algorithms to the algorithms suitable of a pipelined implementation, (Gemelli et al., Col. 1 lines 61 – 66), wherein Huang et al. teaches in FIG. 2a and FIG. 2b show a compression bit map (CEM) method of the conventional 8-bit network address forwarding table in FIG. 1. CBM forwarding table 520 sets each of the starting entries of the range in the forwarding table 510 by bit "1", and other entries by bit "0", as shown in FIG. 2a, (Huang et al., Paragraph 7, Page 1).

The Applicant Argues:

That Huang et al. fails to teach comparing the compressed destination address identifier with forwarding addresses available for routing, which forwarding addresses have been compressed using the compression algorithm and stored as entries of a routing table.

In response, the examiner respectfully submits: Huang et al. teaches Gemelli et al. in view of Huang et al. teaches compressing the network prefix in order to perform the search in a table having a limited size. Many compression methods are known. In particular, we will refer to a method based on predictable duration algorithms, and

among this class of algorithms to the algorithms suitable of a pipelined implementation, (Gemelli et al., Col. 1 lines 61 – 66), wherein Huang et al. teaches a network address forwarding table lookup apparatus and method for identifying a network address to determine a next hop address to which data packets having the network address should be forwarded, (Abstract), and IPv4 address forwarding table lookup apparatus for identifying a 32-bit Internet Protocol (IP) address to determine a next hop address to which data packets having the IP address should be forwarded, (Huang et al., Paragraph 19).

The Applicant Argues:

That there is no Motivation to Combine Gemelli and Huang.

In response, the examiner respectfully submits: Gemelli et al. teaches routing or compressing packets destination address through an electronic routing or compressing device, the packets destination address being n bit packets and having address indicative of a desired destination, wherein the routing table search process is the most important operation in the IP routing method. Huang et al. teaches a network address forwarding table lookup apparatus and method for identifying a network address to determine a next hop address to which data packets having the network address should be forwarded. The motivation to combine Gemelli et al. with Huang et al. is to occupy less memory space, which is smaller than the forwarding table, (Huang et al., Paragraph 7,Page 1).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Shaq Taha** whose telephone number is 571-270-1921. The examiner can normally be reached on 8:30am-5pm Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Jeff Pwu** can be reached on 571-272-6798.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/S. T./

Examiner, Art Unit 2446

/Jeffrey Pwu/

Supervisory Patent Examiner, Art Unit 2446